

Voluntary fortification of bread with folic acid

Annual Report 2016

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A report to the Ministry for Primary Industries

Disclaimer

Every effort has been made to ensure the information in this report is accurate.

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Summary

This report fulfils the reporting requirements of the New Zealand Association of Bakers (NZAB) code of practice (COP) for voluntary folic acid fortification of bread in New Zealand. The COP requires that the Industry will commission an audit of fortified breads each year to verify the levels of folic acid in the range of breads and proportion of breads available in New Zealand that are fortified.

NZAB members have advised that there were 69 varieties of folic acid fortified packaged sliced bread on the market in New Zealand in 2016. This is an 11% increase compared to 2015. While some varieties are regional, the majority are readily available nationally.

In 2016, 37.7 %, by production volume, of packaged sliced bread marketed or distributed by NZAB members or their private label partners was fortified with folic acid. This level was achieved despite there being a world-wide shortage of folic acid up until the middle of 2016. Full supply of folic acid is now secure. Plans to increase the volume of bread fortified with folic acid which had been put on hold because of the ingredient shortage were implemented in July 2016.

All NZAB member bread formulations claiming folic acid fortification, by manufacturing company, were audited. Where product was sold in both the North and South Islands, product from both islands was audited. All samples were taken from the market by shoppers independent of NZAB member companies. A total of 94 breads were sampled across the country. Folic Acid content was tested byASUREQuality using the Biacore method (based on AOAC method 992.05).

Audit results show that the average fortification levels of all breads sampled was 191 µg per 100 grams of bread. The median fortification levels (interquartile range (IQR)) for all bread analyses was 191 µg /100 g (IQR: 140, 237 µg /100 g). Seventyone percent of all samples tested had folic acid test results in the range of $100 \leq r \leq 250$ µg /100 g.

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List of Abbreviations

Baking Industry Research Trust (BIRT)

Code of Practice (COP)

Interquartile range (IQR)

Ministry for Primary Industries (MPI)

New Zealand Association of Bakers (NZAB)

Not Applicable (NA)

Nutrition Information Panel (NIP)

Introduction

In order to help meet the needs of the population of concern with regard to folic acid (i.e., women of child-bearing age) members of the New Zealand Association of Bakers voluntarily add folic acid to some bread products.

This report is written to meet the reporting requirements of NZAB code of practice (COP) for voluntary folic acid fortification of bread. A copy of the COP and list of the companies that have signed up to it is included in Appendix 1 of this report.

A COP was developed to reinforce NZAB commitment to having folic acid fortified bread available to the market. It was developed in conjunction with the Ministry for Primary Industries (MPI). It requires that an audit is carried out to verify the level of folic acid in the range of NZAB packaged sliced loaf breads fortified, and that an annual report be submitted to MPI which includes the following:

- a list of all the breads containing folic acid
- the proportion, by volume, reported as production volume of packaged loaf breads that contain folic acid
- a list of breads that have been tested and the test method used
- the results of tests, identifying the levels of folic acid found in breads
- an explanation of how the goal for fortifying towards 50% of packaged breads in NZ, with folic acid, is being met.

This report relates to the 2016 calendar year.

Supply of Folic Acid

The worldwide shortage of food grade folic acid caused by closure of factories in China while they upgraded to meet environmental regulations eased mid 2016 with factories coming back on stream to supply. This meant that in July 2016 rate of addition of folic acid in the 23 fortified products (where it had been reduced to conserve material supply) was increased back up to the target of 200 µg /100 g, and in August 2016 plans to add folic acid to more products went ahead.

List of breads fortified with folic acid

As at the end of 2016 there were 69 varieties of NZAB folic acid fortified packaged sliced breads on the market in New Zealand as shown in Table 1.

Company reviews of product ranges has resulted in some products being removed from the list and others added. The net result is an increase of 11 % from the 62 varieties that were on the market in 2015.

The Baking Industry Research Trust (BIRT) website, www.bakeinfo.co.nz lists fortified products, including product name, loaf weight, and regions where they are able to be purchased. Bread type, type of outlet and shelf prices in 2016 have been added to the list for the information of readers of this report.

Some bread varieties are only available in one island. However, there is often a similar counter-part available on the other island e.g., Rivermill Wheatmeal in the North Island is equivalent to Golden Bake Wheatmeal in the South Island. Many of the folic acid fortified breads are used by food service customers i.e., restaurants, caterers, cafes, cafeterias, government institutions, rest homes etc. Fortified breads are available in a range of prices.

Table 1 Packaged sliced breads fortified with folic acid

| Product Name | Loaf Weight (g) | Bread Type (White, Wheatmeal, Light Grain or Heavy Grain) | Regions where able to be purchased | Type of Outlet (Supermarket, Dairy, Other) | 2016 On Shelf Price Range (\$ per loaf) |
|-------------------------------------|-----------------|---|------------------------------------|--|---|
| Rivermill Wheatmeal Sandwich | 600 | Wheatmeal | North Island only | Fuel Channel, Dairies, Fruit Shops | 1.65 |
| Rivermill Wheatmeal Toast | 600 | Wheatmeal | North Island only | Fuel Channel, Dairies, Fruit Shops | 1.65 |
| Rivermill Nature's Grain Toast | 600 | Light Grain | North Island only | Fuel Channel, Dairies, Fruit Shops | 1.65 |
| Giant Multigrain Toast | 600 | Light Grain | North Island only | Supermarkets | 1.00 |
| Sunny Crust Multigrain Toast | 600 | Light Grain | National | Supermarkets | 2.78 |
| Sunny Crust Wholemeal Toast | 600 | Wholemeal | National | Supermarkets | 2.78 |
| Golden Bake Wheatmeal Sandwich | 600 | Wheatmeal | South Island only | Fuel Channel, Dairies, Fruit Shops | 1.70 |
| Golden Bake Wheatmeal Toast | 600 | Wheatmeal | South Island only | Fuel Channel, Dairies, Fruit Shops | 1.70 |
| Molenberg Light Grains Toast | 700 | Light Grain | National | Supermarkets | 4.00 |
| Molenberg Light Grains Sandwich | 700 | Light Grain | National | Supermarkets | 4.00 |
| Molenberg Soy & Linseed Toast | 700 | Soy & Linseed | National | Supermarkets | 4.00 |
| Molenberg Grains Plus Toast | 700 | Light Grain | National | Supermarkets | 4.00 |
| Molenberg Original Toast | 700 | Light Grain | National | Supermarkets | 4.00 |
| Molenberg Original Sandwich | 700 | Light Grain | National | Supermarkets | 4.00 |
| Molenberg Original Thick | 700 | Light Grain | National | Supermarkets | 4.00 |
| Signature Range Multigrain Sandwich | 700 | Light Grain | National | Supermarkets | 2.00 |
| Signature Range Multigrain Toast | 700 | Light Grain | National | Supermarkets | 2.00 |

| Product Name | Loaf Weight (g) | Bread Type (White, Wheatmeal, Light Grain or Heavy Grain) | Regions where able to be purchased | Type of Outlet (Supermarket, Dairy, Other) | 2016 On Shelf Price Range (\$ per loaf) |
|--|-----------------|---|------------------------------------|--|---|
| Country Split Italian | 500 | White | National | Supermarkets | 3.65 |
| Country Split Multigrain | 500 | Light Grain | National | Supermarkets | 3.65 |
| Freya's Dutch Wholemeal Grain | 750 | Wholemeal & Light Grain | National | Supermarkets | 3.26 |
| Freya's Quinoa & Flaxseed | 750 | Light Grain | National | Supermarkets | 3.26 |
| Freya's Roggenbrot Dark Rye | 750 | Wholemeal | National | Supermarkets | 3.26 |
| Freya's Swiss Soy & Linseed | 750 | Soy & Linseed | National | Supermarkets | 3.26 |
| Freya's Traditional White | 750 | White | National | Supermarkets | 3.26 |
| Freya's Tuscan Mixed Grain | 750 | Light Grain | National | Supermarkets | 3.26 |
| Freya's Lower Carb 5 Seed | 750 | Light Grain | National | Supermarkets | 3.26 |
| Freya's Lower Carb Soy & Linseed | 750 | Soy & Linseed | National | Supermarkets | 3.26 |
| Quality Bakers Catering Wheatmeal Toast | 700 | Wheatmeal | National | Other | 3.84 |
| Quality Bakers Catering Wheatmeal Sandwich | 700 | Wheatmeal | National | Other | 3.84 |
| Signature Range Wheatmeal Toast | 700 | Wheatmeal | National | Supermarkets | 2.00 |
| Signature Range Wheatmeal Sandwich | 700 | Wheatmeal | National | Supermarkets | 2.00 |
| Quality Bakers Catering White Toast | 700 | White | National | Other | 3.84 |
| Quality Bakers Catering White Sandwich | 700 | White | National | Other | 3.84 |
| Signature Range White Toast | 700 | White | National | Supermarkets | 2.00 |
| Signature Range White Sandwich | 700 | White | National | Supermarkets | 2.00 |

| Product Name | Loaf Weight (g) | Bread Type (White, Wheatmeal, Light Grain or Heavy Grain) | Regions where able to be purchased | Type of Outlet (Supermarket, Dairy, Other) | 2016 On Shelf Price Range (\$ per loaf) |
|---------------------------------------|-----------------|---|------------------------------------|--|--|
| TipTop Supersoft Honey Grain Toast | 700 | Light Grain | National | Supermarket, Dairy, Other | 2.39 to 4.29, \$2.39 lowest price |
| Tip Top Hi Protein with Oats | 700 | Wheatmeal | National | Supermarket, Dairy, Other | 2.95 to 4.99. \$2.95 lowest price |
| Tip Top Hi Protein with Soy & Linseed | 700 | Wheatmeal | National | Supermarket, Dairy, Other | 2.95 to 4.99. \$2.95 lowest price |
| Value White Toast | 600 | White | National | Supermarket, Dairy (4 Square) | 0.90 to 1.00 |
| Value Multigrain Toast | 600 | Light Grain | National | Supermarket, Dairy (4 Square) | 0.90 to 1.00 |
| Value White Sandwich | 600 | White | South Island | Supermarket, Dairy (4 Square) | 0.90 to 1.00 |
| Burgen Soy Linseed Toast | 700 | Heavy Grain | National | Supermarket, Dairy, Other | 2.89 to 4.89, \$2.89 is lowest promo price |
| Burgen Soy Linseed Sandwich | 700 | Heavy Grain | National | Supermarket, Dairy, Other | 2.89 to 4.89, \$2.89 is lowest promo price |
| Burgen Original Mix Grain Toast | 740 | Heavy Grain | National | Supermarket, Dairy, Other | 2.89 to 4.89, \$2.89 is lowest promo price |
| Burgen Original Mix Grain Sandwich | 740 | Heavy Grain | National | Supermarket, Dairy, Other | 2.89 to 4.89, \$2.89 is lowest promo price |
| Burgen Mix Grain Toast | 700 | Heavy Grain | National | Supermarket, Dairy, Other | 2.89 to 4.89, \$2.89 is lowest promo price |
| Burgen Pumpkin Seed Chia | 700 | Heavy Grain | National | Supermarket, Dairy, Other | 2.89 to 4.89, \$2.89 is lowest promo price |
| Burgen Ancient Grains Toast | 700 | Heavy Grain | National | Supermarket, Dairy, Other | 2.89 to 4.89, \$2.89 is lowest promo price |
| Norths Multigrain Toast | 600 | Light Grain | National | Supermarket, Dairy | 1.00 to 3.26 |
| Norths Wheatmeal Toast | 600 | Wheatmeal | National | Supermarket, Dairy | 1.00 to 3.26 |
| Norths White Toast | 600 | White | National | Supermarket, Dairy | 1.00 to 3.26 |

| Product Name | Loaf Weight (g) | Bread Type (White, Wheatmeal, Light Grain or Heavy Grain) | Regions where able to be purchased | Type of Outlet (Supermarket, Dairy, Other) | 2016 On Shelf Price Range (\$ per loaf) |
|-----------------------------|-----------------|---|------------------------------------|--|---|
| Budget White Toast | 600 | White | National | Supermarket, Dairy | 0.90 to 1.00 |
| Budget White Sandwich | 600 | White | National | Supermarket, Dairy | 0.90 to 1.00 |
| Budget Multigrain Toast | 600 | Light Grain | National | Supermarket, Dairy | 0.90 to 1.00 |
| Budget Multigrain Sandwich | 600 | Light Grain | National | Supermarket, Dairy | 0.90 to 1.00 |
| Budget Wheatmeal Toast | 600 | Wheatmeal | National | Supermarket, Dairy | 0.90 to 1.00 |
| Budget Wheatmeal Sandwich | 600 | Wheatmeal | National | Supermarket, Dairy | 0.90 to 1.00 |
| Pams White Toast | 700 | White | National | Supermarket, Dairy | 1.89 to 2.19 |
| Pams White Sandwich | 700 | White | National | Supermarket, Dairy | 1.89 to 2.19 |
| Pams Multigrain Toast | 700 | Light Grain | National | Supermarket, Dairy | 1.89 to 2.19 |
| Pams Multigrain Sandwich | 700 | Light Grain | National | Supermarket, Dairy | 1.89 to 2.19 |
| Pams Wheatmeal Toast | 700 | Wheatmeal | National | Supermarket, Dairy | 1.89 to 2.19 |
| Pams Wheatmeal Sandwich | 700 | Wheatmeal | National | Supermarket, Dairy | 1.89 to 2.19 |
| Salba White Toast | 750 | White | Manaia | Other | 3.00 |
| Salba White Medium | 750 | White | Manaia | Other | 3.00 |
| Plain Pack Multigrain Toast | 600 | Light Grain | Gisborne, East Coast, Wairoa | Pak n Save Gisborne, Other | 1.69 |
| Eastlander Grain Toast | 600 | Light Grain | Gisborne, East Coast, Wairoa | Dairies | 1.70 to 1.90 |
| Gizzy White | 650 | White | Gisborne | Pak n Save Gisborne | 1.99 |
| Gizzy Multigrain | 650 | Light Grain | Gisborne | Pak n Save Gisborne | 1.99 |

Proportion of breads fortified with folic acid

The proportion of breads fortified with folic acid is calculated as a percentage of production volume of packaged sliced breads marketed and/or distributed in New Zealand by NZAB members. New Zealand association of Bakers members produce in excess of 90% of the packaged sliced breads in New Zealand. This includes production of NZAB branded products, and also production of private label products. Individual companies provided production volumes to the author of this report who then collated the information to determine the percentages as shown in Table 2 below.

Table 2 Percentage of packaged sliced breads fortified with folic acid

| | 2012 Production | 2013 Production | 2014 Production | 2015 Production | 2016 Production |
|---------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| NZAB Branded | 18.0 | 16.6 | 15.6 | 28.0 | 32.3 |
| Private Label | 9.0 | 9.1 | 27.0 | 44.3 | 56.9 |
| Total | 14.1 | 14.4 | 19.0 | 32.2 | 37.7 |

The NZAB COP states the following objective:

“The aspirational goal over time is for industry to work towards fortifying with folic acid a minimum of 25% and up to 50%, by volume, reported as production volume numbers, of packaged sliced loaf breads (including private label products) marketed and distributed in New Zealand, by NZAB members. A minimum of 25% by volume will be fortified by the end of 2014.”

In 2016 37.7% of packaged sliced breads produced by NZAB member companies were fortified with folic acid.

Audit of breads claimed to be fortified with folic acid

Background to Audit

Industry developed the COP with the support of MPI. The COP, requires that an annual audit of all bread formulations claiming folic acid fortification, by manufacturer, be audited and tested for folic acid. Where a company sells the product in both the North and South Islands, product from both islands is to be audited. The audit and results described in this report are to meet the COP requirements. The audit is designed to show how well manufacturing companies are fortifying the products they claim to be fortifying.

Method

NZAB member companies each provided a list of the folic acid fortified products they manufacture and in which regions the products are available. They also advised products which had formulations in common. For each NZAB member company, every folic acid fortified bread formulation they manufacture was audited. If a company produces to that formulation in both the North and South Island, samples were collected in both Islands. This sampling regime resulted in 91 bread samples being taken. Three products which had low results, indicating no folic acid added, in the August/September sampling round were re-audited in December. This meant that 94 breads in total were tested. Auditing was carried out after any addition levels reduced due to the earlier folic acid material shortage, had been increased back up to meet the COP target of 200 µg /100 g of finished product.

All folic acid fortified bread formulations were audited by individual manufacturing company and in each island (if applicable). Audit samples were collected in August/September and/or November/December 2016. All formulations were audited at least once.

Samples (one loaf of each product) for each company were collected from stores in areas where their products were known to be sold. The lead auditor assigned a shopping list to an independent 'shopper' in each of the applicable regions. Samples were purchased and details such as date code, colour of closure tag, date of purchase and store location were recorded. Products were then couriered overnight to Auckland or Christchurch, where Nutrition Information Panel (NIP) and ingredient list pack information was scanned. Following this, samples were coded and then delivered to AsureQuality for testing.

Analysis of folic acid content

Samples were tested by AsureQuality using the Biacore Method (based on AOAC method 992.05).

The uncertainty of measurement (error value) for this test is 9.8%.

Results

Table 3 is a summary of the combined audit results for companies manufacturing folic acid fortified breads. Full results are shown in Appendix 2

Table 3 Summary of Audit Results

| Audit | | Aug/Sep 2016 | Nov/Dec 2016 | Total |
|---|-------------------------------------|--------------|--------------|-------|
| Bread Formulations | Total Number Tested | 59 | 35 | 94 |
| | Number from Previous Audit Retested | NA | 3 | NA |
| Number of Samples with Folic Acid Test Result r ($\mu\text{g}/100\text{g}$) | $r < 50$ | 5 | 0 | 5 |
| | $50 \leq r < 100$ | 1 | 1 | 2 |
| | $100 \leq r \leq 200$ | 29 | 14 | 43 |
| | $200 < r \leq 250$ | 19 | 5 | 24 |
| | $r > 250$ | 5 | 15 | 20 |
| Percentage of results with Folic Acid Test Result r ($\mu\text{g}/100\text{g}$) | $r < 50$ | 8.5 | 0 | 5 |
| | $50 \leq r < 100$ | 2 | 3 | 2 |
| | $100 \leq r \leq 200$ | 49 | 40 | 46 |
| | $200 < r \leq 250$ | 32 | 14 | 26 |
| | $r > 250$ | 8.5 | 43 | 21 |
| | $100 \leq r \leq 250$ | 81 | 54 | 71 |

Audit results show that the average fortification levels of the 94 breads sampled was 191 μg per 100 grams of bread. The median fortification level (interquartile range (IQR)) for all bread analyses was 191 $\mu\text{g}/100\text{g}$ (IQR: 140, 237 $\mu\text{g}/100\text{g}$). Seventyone percent of all samples tested had folic acid test results in the range of $100 \leq r \leq 250$ $\mu\text{g}/100\text{g}$.

Five breads were found to have folic acid levels of less than 50 $\mu\text{g}/100\text{g}$. In four of these cases the breads had only just been added to the list of breads to be fortified, and formulation update on the factory floor did not exactly match the introduction of the packaging with folic acid listed in the ingredient list. Only three of the four breads were available for purchase on the day of the second audit, with results for the three audited for the second time being 221, 330 and 282 $\mu\text{g}/100\text{g}$.

When results for products where folic acid has not been added are excluded ($n = 5$) the average fortification levels of breads sampled was 201 μg per 100 grams of bread, and the median fortification level was 198 μg /100 g (IQR: 148, 243 μg /100 g), with 75% of the samples tested having folic acid test results in the range of $100 \leq r \leq 250$ μg /100 g.

In the November/December audit round five breads were found to have levels of folic acid in excess of 300 μg /100g. The manufacturing company which produced this bread was advised to make adjustments to their formulations.

The results presented in Appendix 2 show on pack labelling of fortified breads for each bread audited and audit test results. Sixty-nine percent of the 91 products sampled in this audit did not have the folate content listed in the NIP. Of those that did, the labelled folate content was presented as: 125, 190, 200 and 296 μg /100 g. The 125 μg /100 g product has very small volume and is only sold in one region. The manufacturer has been reminded of the terms of the COP and asked to increase the targeted folate level at their earliest convenience. The 296 μg /100 g is a labelling error on one product only and is to be corrected at the next packaging update.

Table 4 below, listing results of this audit compared to results from previous years, shows that the percentage of sample results in the range of $100 \leq r \leq 250$ μg /100 g being 71% in 2016 is lower than the 84 and 83% achieved in 2014 and 2015. In 2016 21% of sample results are greater than 250 μg /100 g, compared with only 15% in 2015.

Table 4 Comparison of audit results to prior years

| Audit | | 2013 | 2014 | 2015 | 2016 |
|---|-----------------------|------|------|------|------|
| Bread Formulations | Total Number Tested | 60 | 67 | 82 | 91 |
| Number of Samples with Folic Acid Test Result r (μg/100g) | $r < 50$ | 14 | 0 | 0 | 5 |
| | $50 \leq r < 100$ | 8 | 2 | 2 | 2 |
| | $100 \leq r \leq 200$ | 23 | 42 | 47 | 43 |
| | $200 < r \leq 250$ | 4 | 14 | 21 | 24 |
| | $r > 250$ | 11 | 9 | 12 | 20 |
| Percentage of results with Folic Acid Test Result r (μg/100g) | $r < 50$ | 23 | 0 | 0 | 5 |
| | $50 \leq r < 100$ | 13 | 3 | 2 | 2 |
| | $100 \leq r \leq 200$ | 38 | 63 | 57 | 46 |
| | $200 < r \leq 250$ | 7 | 21 | 26 | 26 |
| | $r > 250$ | 18 | 13 | 15 | 21 |
| | $100 \leq r \leq 250$ | 45 | 84 | 83 | 71 |

Discussion

An increasing range of affordable bread products continue to be fortified with folic acid throughout New Zealand. Supply of folic acid is now secure and so the targeted level of 200 µg/100 g finished bread product has been reinstated and can be maintained. Progress has been made to increase the range of fortified products available. In 2016, 69 products representing 37.7% of the total volume produced were fortified with folic acid.

Under the New Zealand (Permitted Fortification of Bread with Folic Acid) Food Standard 2012, bread can contain a maximum of 250 µg of folic acid per 100g of finished product. The NZAB COP has a target level for folic acid of 200 µg/100 g finished bread product. Some manufacturers are still struggling to keep folic acid levels below the maximum.

A few products tested did not have folic acid added. This was a result of timing of updating formulations for use in the factory not exactly coinciding with introduction of updated packaging. Seventyone percent of all samples tested had folic acid test results in the range of $100 \leq r \leq 250$ µg /100 g.

Samples are still occasionally found where the folic acid content is above 300 µg /100 g, and work is continuing by individual manufacturers to determine the correct addition rate, and method of addition, in these few cases.

Next Steps

Work on accurately determining folic acid premix addition levels for each bread type and process will continue with the aim that the targeted level is consistently achieved.

The industry is continuing with plans to increase the volume of products fortified further towards the aspirational target of 50% by volume, including working with its private label partners to increase volume of fortified private label and associated branded formulations.

Next audits are scheduled to be carried out in June and October 2017.

Appendices

Appendix 1

New Zealand Association of Bakers (NZAB) and Private Label Partner's Code of Practice for Voluntary Folic Acid Fortification of Bread is shown below. It has been signed by the following companies:

- Breadcraft (Wai) Ltd
- Foodstuffs Own Brands
- George Weston Foods (NZ) Ltd
- Goodman Fielder New Zealand Ltd
- Walter Findlay Ltd
- Yarrows (The Bakers) 2011 Ltd



New Zealand Association of Bakers (NZAB) and Private Label Partners' Code of Practice for Voluntary Folic Acid Fortification of Bread

Background

The NZAB companies, through their Association, have agreed they will undertake to participate in a Code of Practice (CoP) developed in conjunction with the Ministry for Primary Industries (MPI) to use best endeavour to achieve a minimum percentage of the breads that they produce being fortified with folic acid for NZ consumers.

This CoP sets out this commitment and the steps involved in achieving this goal.

Percentage of breads fortified with folic acid

The aspirational goal over time, is for industry to work towards fortifying with folic acid a minimum of 25% and up to 50%, by volume, reported as production volume numbers, of packaged sliced loaf breads (including private label products) marketed and distributed in New Zealand, by NZAB members. A minimum of 25% by volume will be fortified by the end of 2014.

This will require a proportion of both branded and private label breads to be fortified with folic acid. This is necessary to ensure that folic acid is widely distributed throughout the bread supply consumed by women of child bearing age.

Breads that can be fortified

- Any bread which meets the definition set out in Standard 2.1.1 Cereals and Cereal Products of the Australia New Zealand Food Standards Code may be fortified with folic acid or L-methyltetrahydrofolate, calcium (L-MTHF):
 - *"bread means the product made by baking a yeast-leavened dough prepared from one or more cereal flours or meals and water"*

Addition of folic acid to bread

- Bread can contain a maximum of 2.5 mg/kg (250 µg/100g) of folic acid. This is the maximum amount permitted in the New Zealand (Permitted Fortification of Bread with Folic Acid) Food Standard 2012.
- A target level of 2.0 mg/kg (200 µg/100g) folic acid in the finished product should be used.

Industry commissioned bread audit

- The Industry will commission an independent party outside of the member companies to audit breads throughout each year.

- The audit will verify the level of folic acid in the range of breads and proportion of breads that have been fortified. Over the course of a year all bread formulations claiming folic acid addition, by manufacturer, will be analysed for folic acid. The breads will be sampled randomly and purchased from the market in both the North and South islands where applicable. Folic acid levels will be reported.
- The industry will provide an annual report to MPI on the results of audits. The report will;
 - include a comprehensive list of all the breads containing folic acid
 - include the proportion, by volume, reported as production volume of packaged loaf breads that contain folic acid
 - include a comprehensive list of all breads that have been tested and the test method used
 - include the results of tests, identifying the levels of folic acid found in breads
 - identify how the goal for fortifying towards 50% of packaged breads in NZ, with folic acid, is being met.
- To take into account the commercial sensitivity of information received when presenting information from audit reports to the public MPI and NZAB will agree the information to be released.
- Summary information from audits will also be available from the BIRT website.
- The auditor will provide individual feedback to the member companies on the results of product tests to enable businesses to meet the folic acid standard and meet the goals of this Code of Practice.
- The Industry will work collaboratively with MPI to refine folic acid levels in bread to optimise intake as necessary.

Folic acid methods of analysis

- Measurement of the folic acid content of bread should ensure that folic acid is the analyte measured for targeting and compliance purposes rather than total folate content.
- Laboratories must use appropriate controls including certified reference materials in the analysis of folic acid to ensure adequate accuracy of results
- Laboratories must conduct replicate analyses to ensure the results are precise
- Laboratories must either be accredited to analyse folic acid in cereal foods, or participating in the National Measurement Institute's Proficiency testing programme.

Label information about fortification

- Packaged breads which must be labelled are defined as those produced for retail sale outside the manufacturing premises.
- Where bread requires labelling, and when folic acid or L-MTHF is added, this information must be included in the ingredient list on the label.
- Folate nutrition content claims can be made for bread containing folic acid or L-MTHF.
- A folate health claim can be made for bread fortified with folic acid.

Appendix 2

Results - Folic Acid Bread Audit: August/September 2016 and November/December 2016

| Sample Code | On Pack Information | | FOLIC ACID TEST RESULTS (µg/100g) | | | | | |
|-------------|----------------------|-------------------------|-----------------------------------|------|-----------------------|------------------------|-----|-----------------------|
| | NIP Folate (µg/100g) | Ingredients (Y/N) | Aug/Sep 2016 | | | Nov/Dec 2016 | | |
| | | | Duplicate Test Results | | Average of Duplicates | Duplicate Test Results | | Average of Duplicates |
| 1 | Not in NIP | Y, Vitamin (Folic Acid) | 177 | 172 | 175 | | | |
| 2 | Not in NIP | Y, Vitamin (Folic Acid) | 280 | 266 | 273 | | | |
| 3 | 200 | Y, Vitamin (Folic Acid) | 123 | 117 | 120 | | | |
| 4 | 200 | Y, Vitamin (Folic Acid) | 101 | 104 | 103 | | | |
| 5 | Not in NIP | Y, Folic Acid | 210 | 207 | 209 | | | |
| 6 | Not in NIP | Y, Vitamin (Folic Acid) | 149 | 139 | 144 | | | |
| 7 | Not in NIP | Y, Vitamin (Folic Acid) | 138 | 141 | 140 | | | |
| 8 | Not in NIP | Y, Vitamin (Folic Acid) | 184 | 195 | 190 | | | |
| 9 | 190 | Y, Vitamin (Folic Acid) | 114 | 118 | 116 | | | |
| 10 | 200 | Y, Vitamin (Folate) | 168 | 166 | 167 | | | |
| 11 | 200 | Y, Vitamin (Folate) | 192 | 185 | 189 | | | |
| 12 | 200 | Y, Vitamin (Folic Acid) | 104 | 109 | 107 | | | |
| 13 | Not in NIP | Y, Vitamin (Folate) | 160 | 172 | 166 | | | |
| 14 | 296 | Y, Vitamin (Folic Acid) | 192 | 197 | 195 | | | |
| 15 | 200 | Y, Vitamin (Folic Acid) | 164 | 163 | 164 | | | |
| 16 | Not in NIP | Y, Vitamin (Folic Acid) | 350 | 368 | 359 | | | |
| 17 | Not in NIP | Y, Vitamin (Folic Acid) | 273 | 267 | 270 | | | |
| 18 | 200 | Y, Vitamin (Folic Acid) | 146 | 157 | 152 | | | |
| 19 | 200 | Y, Vitamin (Folic Acid) | 93.9 | 95.1 | 94.5 | | | |
| 20 | 200 | Y, Vitamin (Folic Acid) | 111 | 110 | 111 | | | |
| 21 | Not in NIP | Y, Vitamin (Folic Acid) | 203 | 204 | 204 | | | |
| 22 | Not in NIP | Y, Vitamin (Folic Acid) | 215 | 222 | 219 | | | |
| 23 | Not in NIP | Y, Vitamin (Folic Acid) | 126 | 122 | 124 | | | |
| 24 | Not in NIP | Y, Vitamin (Folic Acid) | 167 | 170 | 169 | | | |
| 25 | Not in NIP | Y, Folic Acid | 221 | 226 | 224 | | | |
| 26 | Not in NIP | Y, Folic Acid | 14.0 | 13.4 | 13.7 | 219 | 223 | 221 |
| 27 | Not in NIP | Y, Folic Acid | 240 | 260 | 250 | | | |
| 28 | Not in NIP | Y, Folic Acid | 247 | 251 | 249 | | | |
| 29 | Not in NIP | Y, Folic Acid | 221 | 211 | 216 | | | |
| 30 | Not in NIP | Y, Vitamin (Folic Acid) | 224 | 225 | 225 | | | |
| 31 | Not in NIP | Y, Vitamin (Folic Acid) | 236 | 228 | 232 | | | |
| 32 | Not in NIP | Y, Vitamin (Folic Acid) | 226 | 218 | 222 | | | |
| 33 | Not in NIP | Y, Vitamin (Folic Acid) | 14.4 | 15.4 | 14.9 | 335 | 325 | 330 |
| 34 | Not in NIP | Y, Vitamin (Folic Acid) | 6.50 | 6.55 | 6.53 | 279 | 284 | 282 |
| 35 | Not in NIP | Y, Vitamin (Folic Acid) | 221 | 229 | 225 | | | |
| 36 | Not in NIP | Y, Vitamin (Folic Acid) | 264 | 270 | 267 | | | |
| 37 | Not in NIP | Y, Vitamin (Folic Acid) | 182 | 183 | 183 | | | |
| 38 | Not in NIP | Y, Vitamin (Folic Acid) | 203 | 205 | 204 | | | |
| 39 | Not in NIP | Y, Vitamin (Folic Acid) | 202 | 214 | 208 | | | |
| 40 | Not in NIP | Y, Vitamin (Folic Acid) | 218 | 222 | 220 | | | |
| 41 | Not in NIP | Y, Vitamin (Folic Acid) | 17.1 | 16.5 | 17 | | | |
| 42 | Not in NIP | Y, Vitamin (Folic Acid) | 16.4 | 16.0 | 16 | | | |
| 43 | Not in NIP | Y, Vitamin (Folic Acid) | 196 | 199 | 198 | | | |
| 44 | Not in NIP | Y, Vitamin (Folic Acid) | 223 | 223 | 223 | | | |
| 45 | Not in NIP | Y, Vitamin (Folic Acid) | 261 | 281 | 271 | | | |

Continued on next page ...

| | | | | | | | | |
|----|------------|-------------------------|-----|-----|-----|------|------|------|
| 46 | Not in NIP | Y, Vitamin (Folic Acid) | 247 | 238 | 243 | | | |
| 47 | Not in NIP | Y, Vitamin (Folic Acid) | 239 | 239 | 239 | | | |
| 48 | 200 | Y, Vitamin (Folic Acid) | 109 | 107 | 108 | | | |
| 49 | 200 | Y, Vitamin (Folate) | 208 | 204 | 206 | | | |
| 50 | 200 | Y, Vitamin (Folate) | 205 | 211 | 208 | | | |
| 51 | 190 | Y, Vitamin (Folic Acid) | 116 | 113 | 115 | | | |
| 52 | 200 | Y, Vitamin (Folic Acid) | 196 | 188 | 192 | | | |
| 53 | Not in NIP | Y, Vitamin (Folate) | 184 | 186 | 185 | | | |
| 54 | 296 | Y, Vitamin (Folic Acid) | 185 | 185 | 185 | | | |
| 55 | 200 | Y, Vitamin (Folic Acid) | 120 | 120 | 120 | | | |
| 56 | 200 | Y, Vitamin (Folic Acid) | 148 | 147 | 148 | | | |
| 57 | 200 | Y, Vitamin (Folic Acid) | 132 | 135 | 134 | | | |
| 58 | 200 | Y, Vitamin (Folic Acid) | 127 | 125 | 126 | | | |
| 59 | 200 | Y, Vitamin (Folic Acid) | 120 | 115 | 118 | | | |
| 60 | 125 | Y, Folic Acid | | | | 157 | 146 | 152 |
| 61 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 321 | 307 | 314 |
| 62 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 299 | 290 | 295 |
| 63 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 193 | 187 | 190 |
| 64 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 285 | 300 | 293 |
| 65 | Not in NIP | Y, Folic Acid | | | | 314 | 332 | 323 |
| 66 | Not in NIP | Y, Folic Acid | | | | 296 | 304 | 300 |
| 67 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 316 | 313 | 315 |
| 68 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 310 | 309 | 310 |
| 69 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 298 | 291 | 295 |
| 70 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 255 | 248 | 252 |
| 71 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 208 | 209 | 209 |
| 72 | 200 | Y, Vitamin (Folic Acid) | | | | 114 | 112 | 113 |
| 73 | 200 | Y, Vitamin (Folate) | | | | 203 | 209 | 206 |
| 74 | 190 | Y, Vitamin (Folic Acid) | | | | 94.8 | 95.0 | 94.9 |
| 75 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 164 | 157 | 161 |
| 76 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 300 | 295 | 298 |
| 77 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 316 | 321 | 319 |
| 78 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 147 | 142 | 145 |
| 79 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 282 | 298 | 290 |
| 80 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 139 | 132 | 136 |
| 81 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 150 | 161 | 156 |
| 82 | 200 | Y, Vitamin (Folic Acid) | | | | 104 | 102 | 103 |
| 83 | 190 | Y, Vitamin (Folic Acid) | | | | 132 | 132 | 132 |
| 84 | Not in NIP | Y, Vitamin (Folic Acid) | | | | 169 | 165 | 167 |
| 85 | Not in NIP | Y, Folic Acid | | | | 140 | 143 | 142 |
| 86 | Not in NIP | Y, Folic Acid | | | | 274 | 273 | 274 |
| 87 | Not in NIP | Y, Folic Acid | | | | 213 | 223 | 218 |
| 88 | Not in NIP | Y, Folic Acid | | | | 155 | 160 | 158 |
| 89 | Not in NIP | Y, Folic Acid | | | | 232 | 230 | 231 |
| 90 | Not in NIP | Y, Folic Acid | | | | 179 | 172 | 176 |
| 91 | Not in NIP | Y, Folic Acid | | | | 181 | 174 | 178 |